

CLAIMS

1. A method for isolating macromolecules comprising:
coating an inner wall of a test tube with a defined quantity of
beads;
coating the beads with a capture reagent of the macromolecule of
interest;
incubating the coated beads with a solution containing the
macromolecule under conditions to allow binding of the macromolecule to
the binding partner;
washing the coated beads with the bound macromolecule with a
wash buffer to remove unbound material while maintaining binding of the
macromolecule to the binding partner; and
eluting the macromolecule from the binding partner.

2. The method of claim 1, wherein the beads are glass
microbeads.

3. The method of claim 1, where in the beads are polymer
microbeads.

4. The method of claim 3, wherein the microbeads are agarose.

5. The method of claim 1, wherein the binding partner is attached
to the beads by at least one linker molecule.

6. The method of claim 1, wherein the linker molecule is
aminopropyltriethoxysaline.

7. The method of claim 1, wherein the linker molecule is cyanogen
bromide.

2 8. The method of claim 5, wherein in the linker molecule is a
chemical cross-linking agent.

4 9. The method of claim 8, wherein the cross-linking agent is
dimethyl suberimidate.

6 10. The method of claim 5, wherein the linker molecule is an
8 antibody.

10 11. The method of claim 5, wherein the linker molecule is protein
A or protein G.

12 12. The method as in claim 1, wherein the wash buffer is removed
14 by inversion of the tube.

16 13. A method for coating an inner wall of a plastic tube with glass
beads comprising:

18 heating a substantially quantity of beads to a temperature sufficient
to superficially melt the inner wall of the tube to be coated;

20 filling the tube to a defined level with the heated beads; and
removing unattached beads.

22 14. The method of claim 13, wherein the inner wall of the tube
24 comprises a bottom portion of the inner wall.

26 15. A method for coating a tube with polymer microbeads
comprising:

28 heating a defined portion of an inner wall of the tube to its melting
point;

30 filling the tube with polymer microbeads to cover the portion of the
wall heated to its melting point; and

removing unattached polymer microbeads.

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16. The method of claim 15, wherein the polymer microbeads are
4 agarose beads.

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17. The method of claim 15, wherein the inner wall of the tube is
heated using a heat gun.

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18. The method of claim 15, wherein the inner wall of the tube is
heated using infrared irradiation.

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19. The method of claim 15, wherein the inner wall of the tube is
heated using a filament.

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20. The method of claim 15, wherein the inner wall of the tube
comprises a bottom portion of the inner wall.

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21. An apparatus comprising a tube with an inner wall and a
bottom portion, wherein the inner wall of the bottom portion of the tube
is coated with beads.

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22. The apparatus of claim 21, wherein the beads comprise glass.

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23. The apparatus of claim 21, wherein the beads comprise
polymer microbeads.

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24. The apparatus of claim 23, wherein the polymer microbeads
comprise agarose.

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25. An apparatus for preparation of glass bead coated tubes
comprising:

a container with a top opening for heating glass beads;
a heating element in functional contact with the container;
a first conduit with a first and second end, wherein the first end of
the conduit is functionally connected to the top opening of the container
and the second end of the conduit is shaped to fit snugly inside a tube to
be coated with beads; and
a pivotable rod functionally attached to the container to allow the
container to be rotated vertically at least about 180 degrees.

26. A method for isolating guanine nucleotide-binding proteins for
determination of guanine nucleotide ratios comprising:

coating an inner wall of a test tube with a defined quantity of glass
beads wherein the beads have a surface;

reacting the beads with an agent to modify the surface of the
beads to provide a plurality of free amino groups;

reacting the free amino groups on the beads with a bifunctional
amine cross-linker to provide a plurality of sites for binding a guanine
nucleotide-binding protein binding partner;

incubating the coated beads with a solution containing the guanine
nucleotide-binding protein under conditions to allow binding of the guanine
nucleotide-binding protein to the binding partner while inhibiting nucleotide
hydrolysis or release;

washing the coated beads with the bound guanine nucleotide-
binding protein with a wash buffer to remove unbound material while
maintaining binding of the guanine-nucleotide binding protein to the
binding partner and inhibiting nucleotide hydrolysis and release;

releasing the bound nucleotide from the guanine-nucleotide binding
protein; and

determining the ratio of guanine nucleotides released from the
guanine nucleotide-binding proteins.